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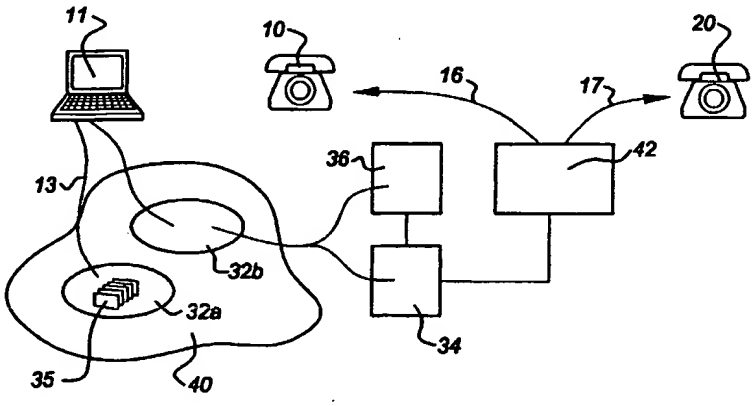
(54) Title: SYSTEM FOR ESTABLISHING A TELEPHONE CONNECTION



(57) Abstract

System for establishing a telephone connection between a first telephone handset and a second telephone handset. Each subscriber to a telephone service has, in addition to the first handset, a computer which is connected to the Internet and has been suitably programmed. The telephone service has an information server, by means of which the telephone service administers, and makes available, an own page on the Web for each of its subscribers, as well as an Internet server, by means of which instructions to establish connections from the Internet to a telephone exchange can be transmitted. Furthermore, the system is provided with a memory, in which a number of subscriber data for each subscriber are stored, a telephone exchange, which is able to establish connections via existing telephone communications routes, and a conversion processor, by means of which data originating from a Web page can be converted into control instructions for the telephone exchange. The subscriber first connects to the Internet and receives his/her own page. The subscriber enters his/her identification data, which can be checked by the service on the basis of the data in the database, and enters the numbers of the two handsets, after which the desired connection is established by the telephone exchange.

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System for establishing a telephone connection

The invention relates to a system for establishing a telephone connection between a first telephone handset and a second telephone handset. In particular the invention is aimed at so-called call-back systems.

Such systems are known per se. The subscriber to a telephone service who makes use of such a system can call the telephone service from an arbitrary handset, exchange his/her identification data, specify the handset from which he/she is calling and then give instructions to establish a connection to another handset. The subscriber then terminates the connection to the telephone service and waits until the exchange has established the requested connection to the second handset, at which point in time the subscriber is called back.

The aim of the invention is, now, to implement the access to such a service in a more customer-friendly manner.

This objective is achieved by a system for establishing a telephone connection between a first telephone handset and a second telephone handset, comprising

- a computer which is connected to the Internet and has been suitably programmed.
- a telephone service with subscribers,
- an information server, by means of which the telephone service administers and makes available an own page on the Web for each of its subscribers,
- an Internet server by means of which instructions to establish connections from the Internet to a telephone exchange can be transmitted,
- a memory in which a number of subscriber data are stored for each subscriber,
- a telephone exchange which is able to establish connections via existing telephone communication routes,
- a conversion processor by means of which data originating from a Web page can be converted into control instructions for the telephone exchange,

wherein a subscriber

a) first makes connection to the Internet and calls up his/her own page from the telephone service,

b) enters identification data which can be checked by the service on the basis of the data in the database,

c) enters the number of the first handset, that is to say the handset that will be used

by the subscriber after establishment of the connection, and the number of the handset to which the connection is desired, which numbers are processed by the conversion processor to give control instructions for the telephone exchange,

after which the desired connection is established by the telephone exchange.

By making use of an Internet page access to the telephone service becomes very simple. Access to the Internet is already possible in a very large number of countries and the number of persons who have access to the Internet via a provider is growing every day.

It has been assumed in the above that the subscriber can use any arbitrary handset in the world as first handset. In itself this is also possible, although reliable identification of the subscriber who calls via an arbitrary handset can give rise to problems. Moreover, there will not be further equipment for establishing a connection to the Internet in the case of every handset.

It is therefore also preferable to restrict the number of handsets and to use only handsets for which the handset details are known per se to the telephone service. In other words, a preferred embodiment of the system is characterised in that the subscriber can only make use of a predetermined, limited number of first handsets, the handset data of which are known in the memory of the telephone service.

There are various ways of indicating in the Web page from which handset to which handset a connection is desired. A more or less obvious possibility is offered in an embodiment of the system that is characterised in that the first handset and/or the second handset is selected by keying in the associated telephone number. This selection option applies in particular if the number of handsets from which a choice can be made is large.

Instead of keying in a number directly, it is preferable to make use of the facilities offered by the Internet and to carry out the selection process in such a way that the first handset and/or the second handset is selected by pointing and clicking on

a) a name

b) a photograph

c) a graphical image

d) an icon

c) a number

d) a combination of one or more of the abovementioned possibilities.

This will be discussed in more detail below with reference to examples and

illustrations.

In general it is fairly simple to gain access to the program code (the so-called HTML code) with which each page is generated. Depending on the embodiment, it is not always possible to avoid telephone numbers having to be incorporated in this code. To prevent misuse of this knowledge, it is preferable that the details by means of which a telephone handset can be identified are transferred in encrypted form over the Internet and are also present in this form in the code for the Web page of each subscriber.

The invention will be explained in more detail below with reference to a few figures.

Figure 1 illustrates, diagrammatically, a system and method according to the prior art.

Figure 2 illustrates, diagrammatically, a system that functions in accordance with the invention.

Figure 3 illustrates, diagrammatically, as an example how a specific subscriber can make his/her selection via one or more Internet pages.

Figure 1 shows, as an example, a system from the prior art. The subscriber has a telephone handset 10 and in this example wants to make a connection to someone who has a telephone handset 20. The subscriber is connected to a telephone service 15 which, via an exchange 30, is capable of establishing connections to arbitrary other telephone handsets. In practice, the telephone service usually has a number of dial-up points distributed over the world such that there is always a dial-up point within a relatively short distance.

To make the connection the subscriber 10 first calls the telephone service 15 via the connection 12 and gives instructions to establish a connection between his/her handset 10 and the telephone handset 20. With this procedure a check is first made, for example on the basis of passwords and the like, that the subscriber is indeed who he/she alleges to be and thereafter the details of the two telephone handsets 10 and 20 specified by the subscriber are transmitted via the connection 18 to the exchange 30. In the interim the subscriber terminates the connection 12.

The exchange 30 then comes into action, which establishes both the connection 22 to the handset 10 and the connection 24 to the handset 20. Details of this establishment of the connection are not given because, on the one hand, they can be assumed to be known to a person skilled in the art and, on the other hand, they are not important in connection

with the invention.

Figure 2 now shows how a connection between the telephone handset 10 and the telephone handset 20 can be established in the manner according to the invention. In this case the subscriber is provided with a personal computer 11 and the necessary software to be able to connect to the Internet 40, in addition to his/her telephone handset 10. The telephone service is present on the Internet by means of an Internet server 32 via which one or more Web pages are made available, which pages are indicated diagrammatically by 35. The Internet server 32 is coupled via a suitable interface to a conversion processor 34 and to a memory 36 in which subscriber data can be stored. The telephone service also has at its disposal at least one exchange 42 for actually establishing the telephone connections.

In practice, two logically separate servers 32a and 32b will be used. The server 32a serves to generate the Web pages. This server can be administered by the telephone service, but optionally can also be administered by others. The server 32b serves for receiving instructions to establish connections from the Internet. As soon as the Web page from server 32a has reached the user's computer, the user can generate instructions, from the computer, which are addressed to server 32b in such a way that these instructions can be recognised as legitimate. Only if the instructions comply with all requirements and contain the correct information fields will they be processed by the server 32b and will it thus be possible to establish connections.

To establish a telephone connection, the subscriber thus starts by logging in to the Internet with the aid of his/her computer 11 via the connection 13 and calling up the telephone service home page from the server 32a. In the simplest case a page with one or more fields to be completed is displayed on the screen of the computer 11, as is shown diagrammatically in Figure 3a. The subscriber must, for example, enter his/her name and a password in this page, optionally accompanied by further identification data. After clicking on the OK button, the data entered are compared in the server 32a with the data which are present in a subscriber file and if they correspond the subscriber is given access to his/her "own" page, such as, for example, is shown diagrammatically in Fig. 3b.

In the example in Fig. 3b it has been assumed that the subscriber has at his/her disposal a normal, fixed telephone handset, which is symbolised by the graphical symbol 44, and a mobile handset, which is symbolised by the graphical symbol 46. Using the mouse pointer, the subscriber clicks on one of these symbols to indicate which handset is

going to be called.

It has also been assumed that the second handset has to be selected by entering the relevant telephone number. To facilitate this input, it is possible, for example, to present a list 48 of frequently used telephone numbers through which the subscriber can scroll in the known manner using the highlighter bar 47. The selection can then be made by clicking on a number. If the desired number is not in the list, it can be incorporated in the list and optionally saved in the latter for later re-use.

After the details of the two telephone handsets have been entered in this way and the instruction to establish the connection has been given by the user via the OK button, these connection details are transported via the Internet to the server 32b. The details are compared with the data in the memory 36. If the details are found to be correct, they are then translated by the conversion unit 34 into control signals for the exchange 42. This exchange is ultimately responsible for making the connection 16 to the handset 10 and the connection 17 to the handset 20.

Following receipt of the data by the server 32b and checking of the data in the memory 36 and activation of the switching unit 42, instructions are sent via the Internet, by means of the conversion unit 34, to the subscriber's computer 11 in such a way that the subscriber is presented with one or more messages on screen which indicate the progress of establishment of the connection, the number of minutes the connection has already lasted, etc.

As indicated above, the selection data can be entered by entering the actual telephone numbers, but preferably use is made of icons, graphical images, photographs and the like, such as, for example, the graphical telephone handset symbols 44 and 46 in Fig. 3b. A number of possible examples are shown in Figure 3c:

1) A list 50 of names of persons or businesses which can be clicked on using the mouse in order thus to make a selection. If the list is longer, it is possible to scroll through the list in a manner known per se, the buttons 51a and 51b being provided for this purpose.

2) A series of photographs 52 of persons or businesses which can be clicked on using the mouse in order thus to make a selection.

3) One or more graphical images, logos or the like 53 which have a particular and highly recognisable meaning for the subscriber. By way of example, a graphical representation of a book 53 is shown. If the subscriber clicks on this graphical book

symbol 53, the subscriber knows that he/she is then choosing to establish a connection to the library.

It will be clear that when the options 1), 2) or 3) are used the subscriber does not have to know any numbers. Clicking on the photograph, the name and the like is sufficient to ensure that the telephone service will use the data associated with this for establishment of the connection.

A single exchange 42 is shown in Figure 2. It should be clear that instead of a single exchange it is also possible for a large number of exchanges to be activated in the connection establishment process, depending on the geographical locations of the two terminal handsets between which the connection has to be made.

A more detailed description of an illustrative embodiment of the hardware and software needed to implement the system will be given below with reference to Figure 4. Figure 4 shows, diagrammatically, a configuration provided with:

- a browser 52 installed on the subscriber's computer 11,
- an Internet information server 54 which is able to communicate with the browser 52 in a known manner, via the HTTP protocol,
- a conversion control unit 57 which is coupled via a Web communication protocol WCP 56 and via an ISAPI interface 55 to the Internet information server 54,
- a relational database 58, which can be addressed by the control unit 57 via a database manager RDBMS to check subscriber data,
- a switching unit 60, which can be controlled by the control unit via a switching protocol WSP 61 and by means of which the direct coupling to the telephone network is produced,
- a monitor 62 which is connected via a monitor operation protocol MOP 63 to the control unit. This monitor is not necessary, but is useful for monitoring and checking that the system is operating correctly.

It is assumed per se that a large number of the abovementioned components are known to those skilled in the art (the majority of these components are commercially available), so that a more detailed discussion of the components per se is in fact superfluous. Working on this assumption, the functioning of the system shown diagrammatically in Figure 4 is also assumed to be known. It may be that only the control unit 57 requires some more detailed explanation.

As Figure 5 shows, the control unit 57 can be subdivided into a number of sub-

processes. Initially contact is made via the Web communication protocol WCP with the Web connection manager WCM 65 to which a number of request handlers 66 have been connected on the output side. The switch manager 68, to which a number of switch control units 69 have been connected, is located on the other side of the control unit 57. The task manager 70, which ensures that a specific connection request, submitted via one of the units 66, is translated into control instructions for one or more of the switch control units 69, is located centrally in the control unit 57.

The database abstraction layer, via which connection can be made to the relational database 58, is also located centrally in the control unit 57.

Systems of the type described in this specification must comply with certain requirements in respect of confidentiality, to prevent possibly confidential data relating to subscribers, telephone numbers and the like from easily being able to come into the hands of third parties. In order to guarantee confidentiality, it is preferable that the data by means of which a telephone handset can be identified are transferred in encrypted form over the Internet and is also present in encrypted form in the code of each subscriber's Web page.

In the above it has been indicated simply that the data entered are transmitted to the exchange for establishment of the requested connection. Actually, a wide variety of other checks are frequently also carried out, such as:

- checking that the instructions are legitimate
- checking the (encoded) user's telephone number (active, existing, etc.)
- checking the (encoded) destination number (existing, permitted for this customer (i.e. checking the relationship, etc.))
- selected language
- special requirements (for example wants to be called back later)
- collation of data (where are the instructions coming from (IP number), what is the graphical screen after processing, etc.)

More than simply clicking on a photograph, a name or the like can also take place on the subscriber's screen. On his/her graphical interface the subscriber receives a message on the status of the instructions (being executed now, have been refused, are not recognised, line busy, etc.) and his/her destination number tinkles/rings or otherwise indicates that connection has been or is being made. If the subscriber has only one telephone line, on completion of the selection process a message will be displayed on the

screen that the connection to the Internet has to be cancelled in order to free the line for the call that is being established.

It has been assumed in the above that the telephone handset 10 is a conventional handset. However, the system also functions if the handset 10 is a so-called Internet telephone, that is to say a program that reacts like a telephone, but is then connected to the Internet. In this case the Internet thus forms at least part of the communication route over which the connection is established.

CLAIMS

1. System for establishing a telephone connection between a first telephone handset and a second telephone handset, comprising

- a computer which is connected to the Internet and has been suitably programmed.
- a telephone service with subscribers,
- an information server, by means of which the telephone service administers and makes available an own page on the Web for each of its subscribers,
- an Internet server by means of which instructions to establish connections from the Internet to a telephone exchange can be transmitted,
- a memory in which a number of subscriber data are stored for each subscriber,
- a telephone exchange which is able to establish connections via existing telephone communication routes,
- a conversion processor by means of which data originating from a Web page can be converted into control instructions for the telephone exchange,

wherein a subscriber

a) first makes connection to the Internet and calls up his/her own page from the telephone service,

b) enters identification data which can be checked by the service on the basis of the data in the database,

c) enters the number of the first handset, that is to say the handset that will be used by the subscriber after establishment of the connection, and the number of the handset to which the connection is desired, which numbers are processed by the conversion processor to give control instructions for the telephone exchange,

after which the desired connection is established by the telephone exchange.

2. System according to Claim 1, characterised in that the subscriber can only make use of a predetermined, limited number of first handsets, the handset details of which are known in the memory of the telephone service.

3. System according to Claim 1 or 2, characterised in that the first handset and/or the second handset is selected by keying in the associated telephone number.

4. System according to Claim 1 or 2, characterised in that the first handset and/or the second handset is selected by pointing and clicking on

a) a name

b) a photograph

c) a graphical image

d) an icon

c) a number

d) a combination of one or more of the abovementioned possibilities.

5. System according to one of the preceding claims, characterised in that the details by means of which a telephone handset can be identified are transferred in encrypted form over the Internet and are also present in this form in the code for the Web page of each subscriber.

6. System according to one of the preceding claims, characterised in that the subscriber receives, on his/her computer screen, messages relating to the status of the establishment of the telephone connection.

Fig 1

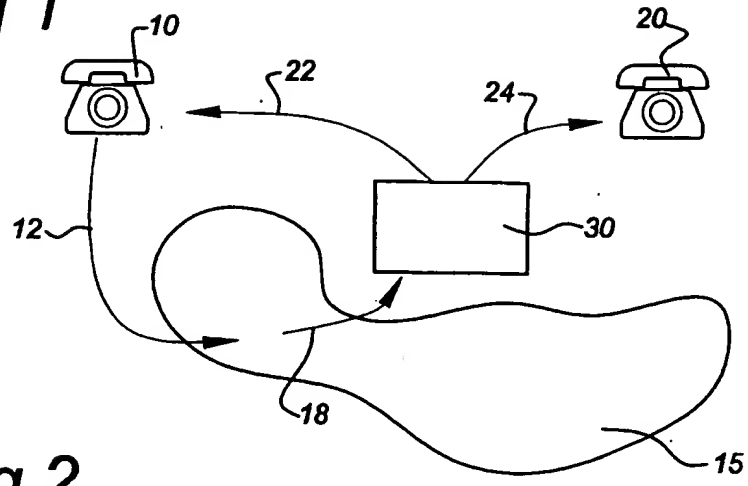


Fig 2

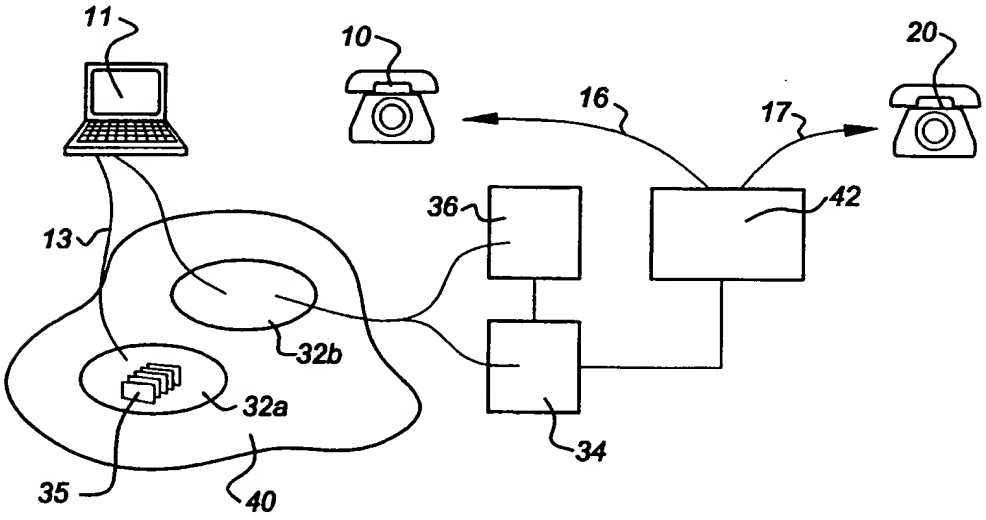


Fig 3a

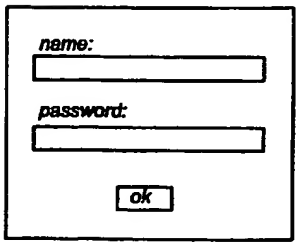


Fig 3b

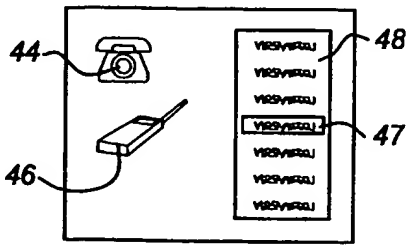


Fig 3c

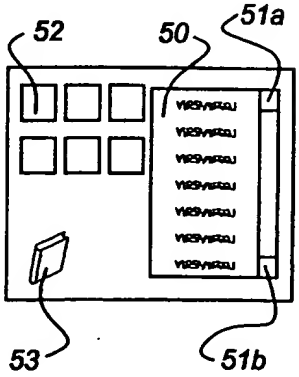


Fig 4

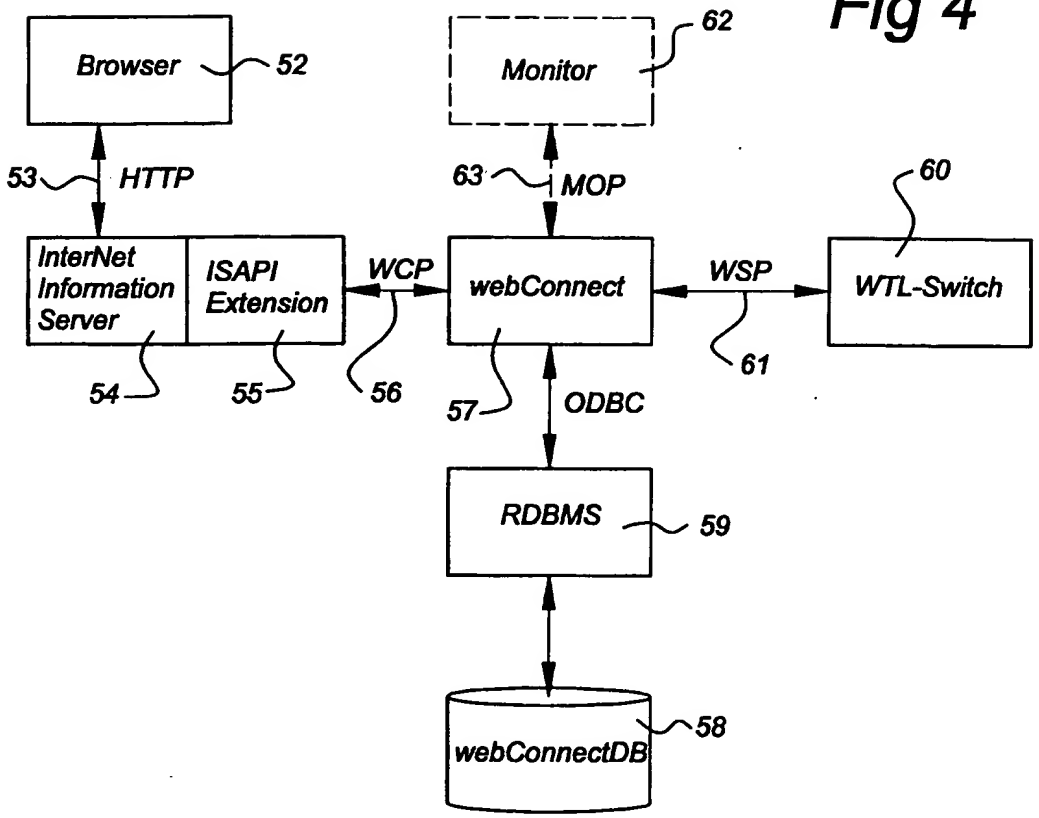
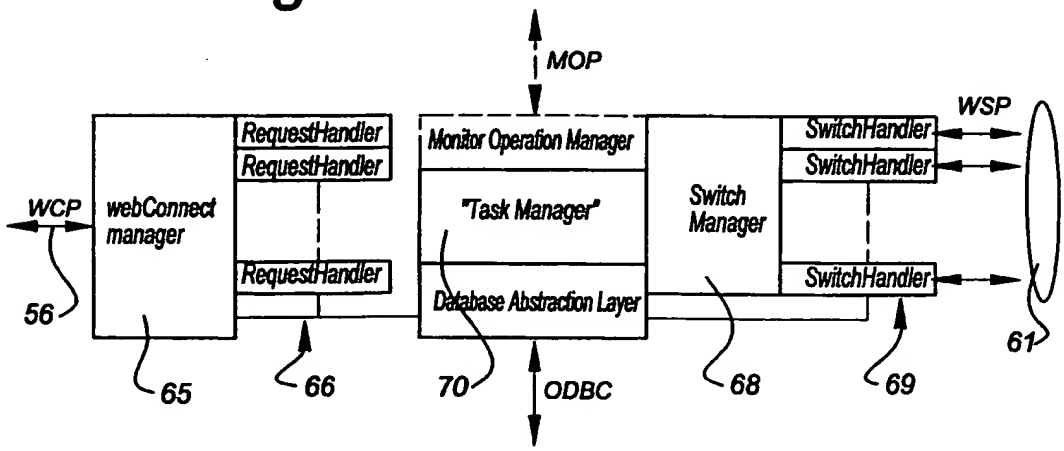

Browser
52
Monitor
62
53
HTTP
63
MOP
60
InterNet Information Server
ISAPI Extension
WCP
webConnect
WSP
WTL-Switch
54
55
56
57
61
ODBC
RDBMS
59
webConnectDB
58

Fig 5


MOP
WSP
RequestHandler
RequestHandler
RequestHandler
Monitor Operation Manager
"Task Manager"
Database Abstraction Layer
Switch Manager
SwitchHandler
SwitchHandler
SwitchHandler
WCP
webConnect manager
56
65
66
70
ODBC
68
69
61

INTERNATIONAL SEARCH REPORT

International Application No
PCT/NL 00/00081

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04M3/54 H04M7/12 H04M3/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 97 23988 A (HARRIS STEPHEN ;BRITISH TELECOMM (GB)) 3 July 1997 (1997-07-03) page 6, line 21 -page 14, line 13 page 15, line 5-11 page 17, line 21 -page 18, line 4 figures 2-7	1,3,4,6 2,5
Y	EP 0 847 176 A (IBM) 10 June 1998 (1998-06-10) column 2, line 20-40 figure 2	2

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
18 May 2000	26/05/2000

Name and mailing address of the ISA	Authorized officer
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national Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

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(43) Date of A Publication 24.06.1998

(21) Application No 9625527.8

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(56) Documents Cited
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US 5438616 A

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(54) Telephone call initiation

(57) A system is described for establishing a telephone connection between a first party and a second party. A client computer terminal 2 responds to user input of the first party to generate a telephone call specifying message TCSM that is passed via a computer network link (e.g. Internet link) to a server computer apparatus 10. The server computer apparatus 10 controls a telephone call initiator 12 that makes a first call back to the first party and when this is answered then makes a second call to the second party and then connects the first party to the second party. The telephone call initiator 12 can generate a voice announcement to be played when the first call is answered. The server computer apparatus 10 electronically bills the first party when the call is terminated. The telephone call initiator 12 can establish third and further calls to additional parties to enable conference calls to be made.

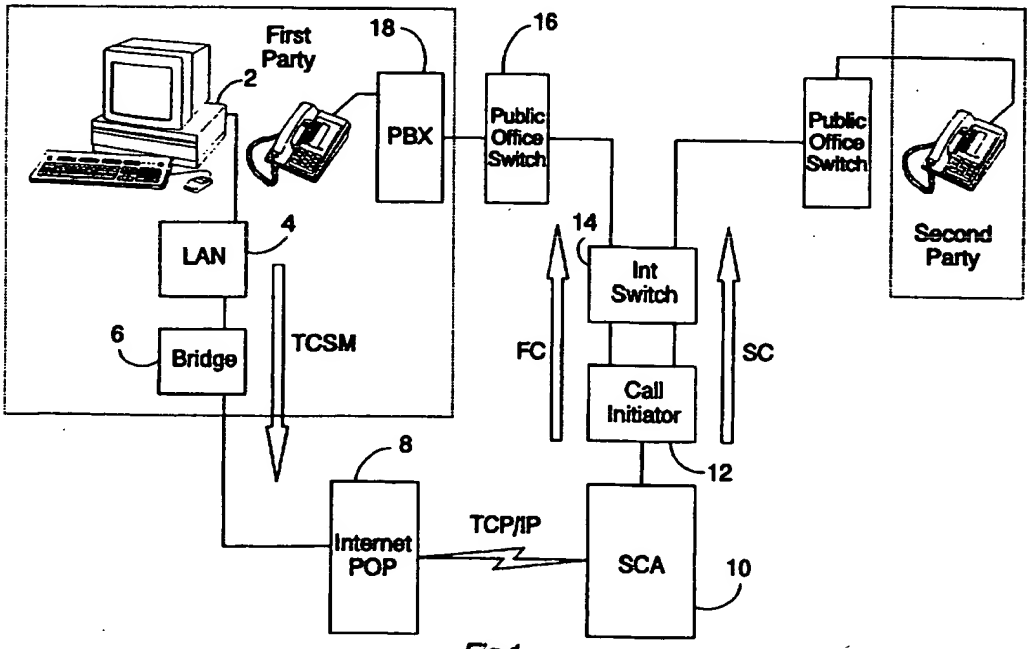

Fig.1

GB 2 320 641 A

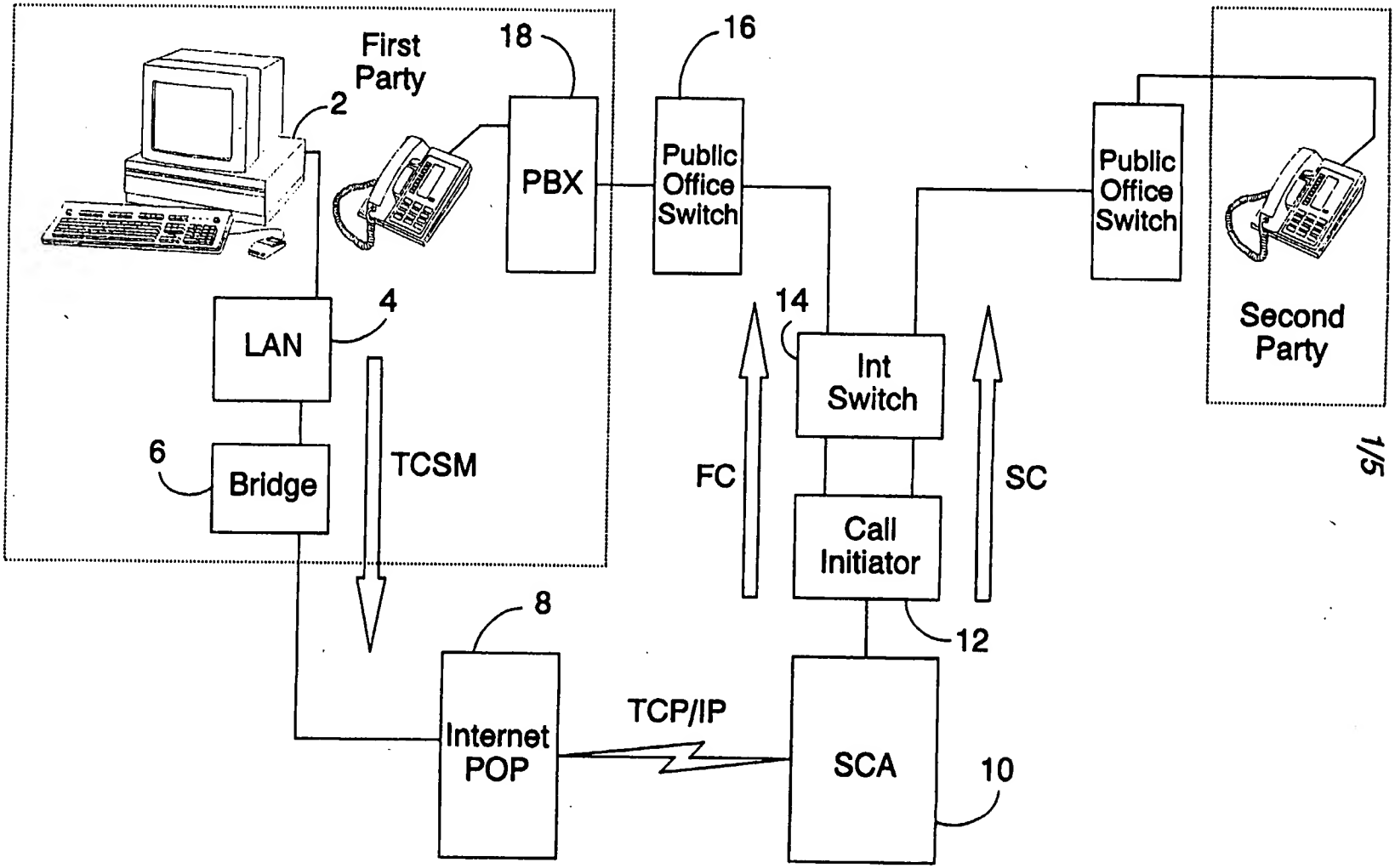
First Party
2
18
16
PBX
Public Office Switch
Public Office Switch
Second Party
LAN
4
14
Int Switch
6
Bridge
TCSM
FC
SC
Call Initiator
8
12
Internet POP
TCP/IP
SCA
10

Fig.1

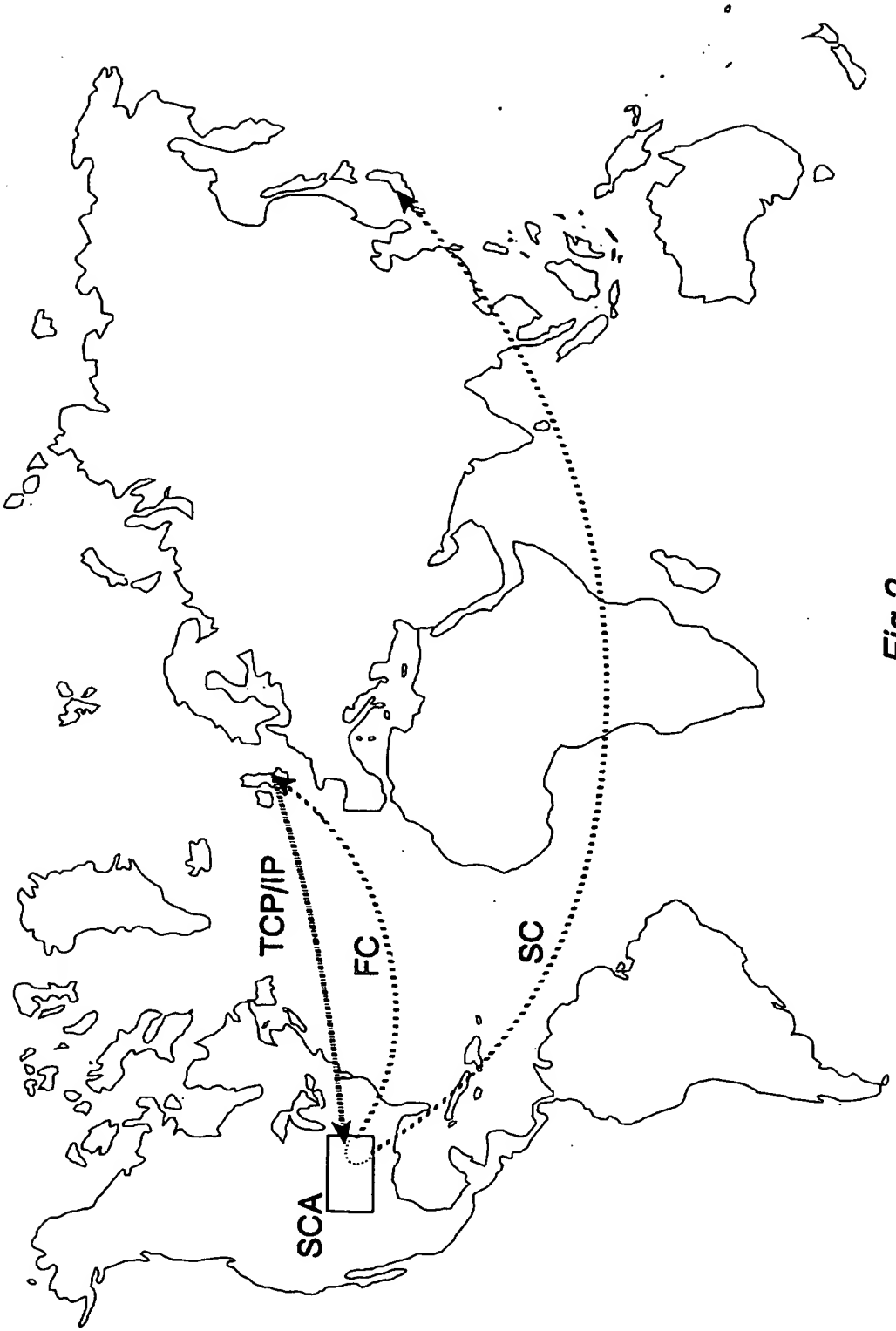

Fig.2

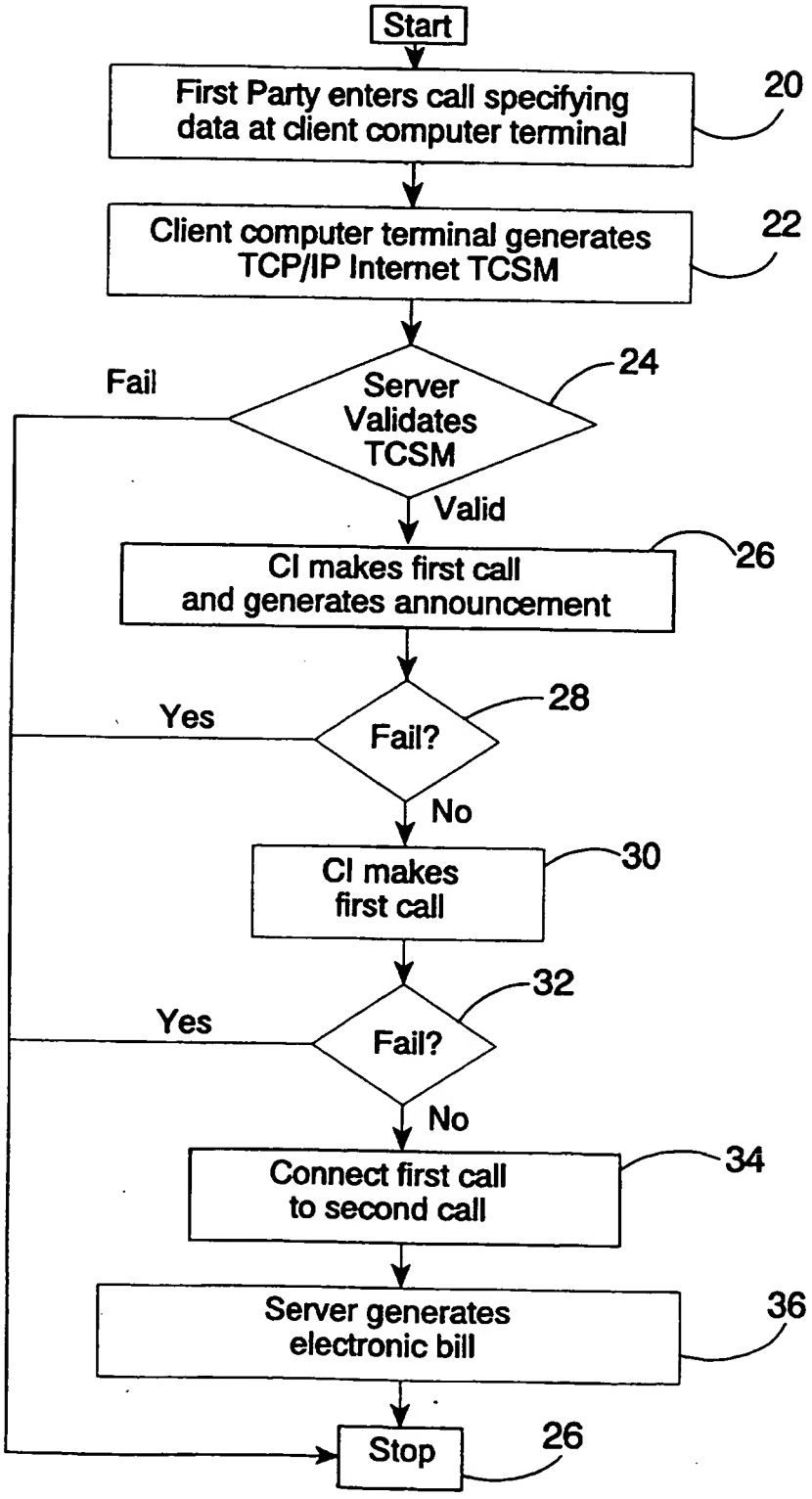
Start
First Party enters call specifying data at client computer terminal
20
Client computer terminal generates TCP/IP Internet TCSM
22
Server Validates TCSM
24
Fail
Valid
CI makes first call and generates announcement
26
Fail?
28
Yes
No
CI makes first call
30
Fail?
32
Yes
No
Connect first call to second call
34
Server generates electronic bill
36
Stop
26

Fig.3

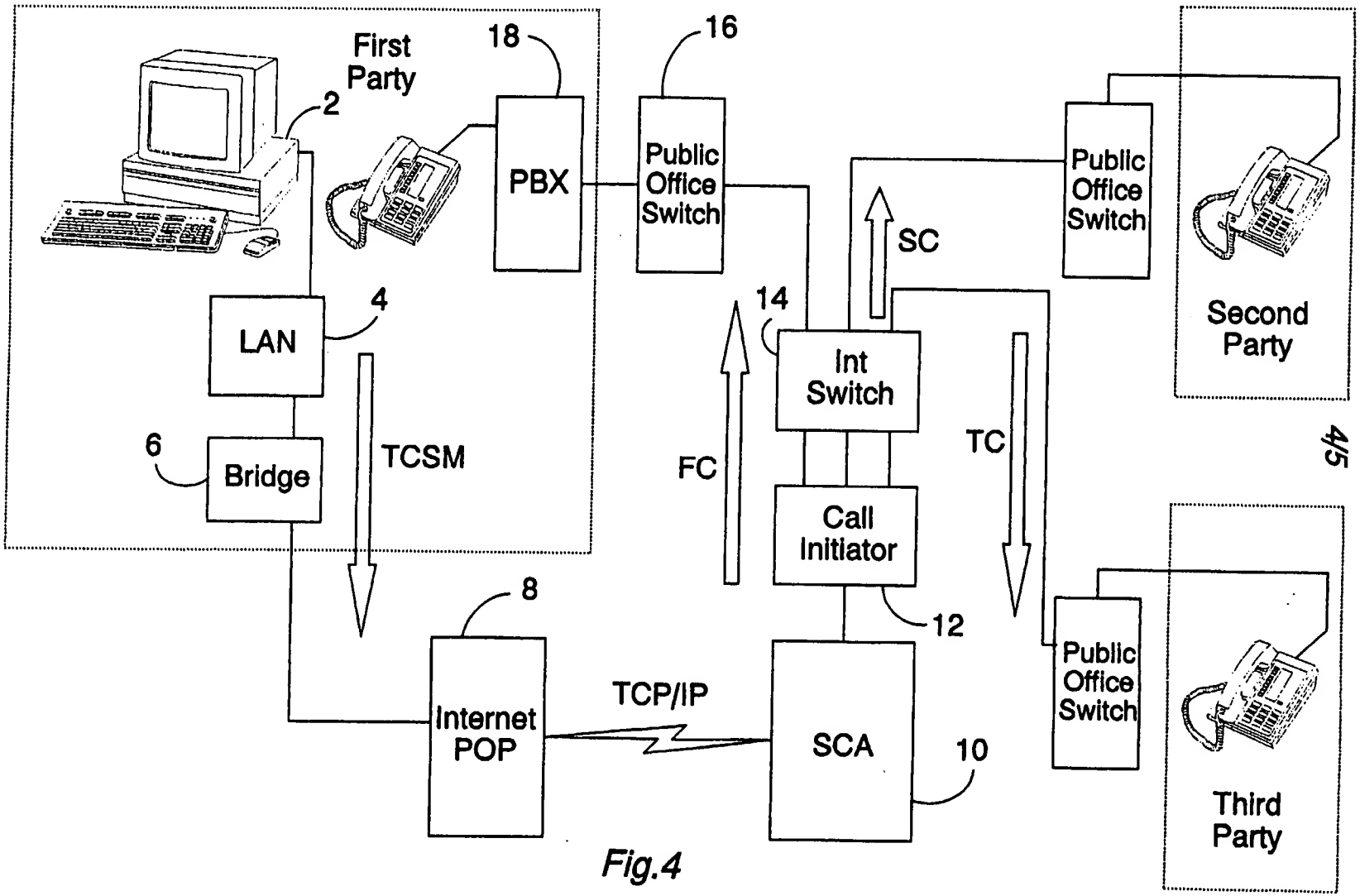
First Party
2
18
16
PBX
Public Office Switch
Public Office Switch
SC
Second Party
LAN
4
14
Int Switch
6
Bridge
TCSM
FC
TC
Call Initiator
8
12
Public Office Switch
Internet POP
TCP/IP
SCA
10
Third Party

Fig.4

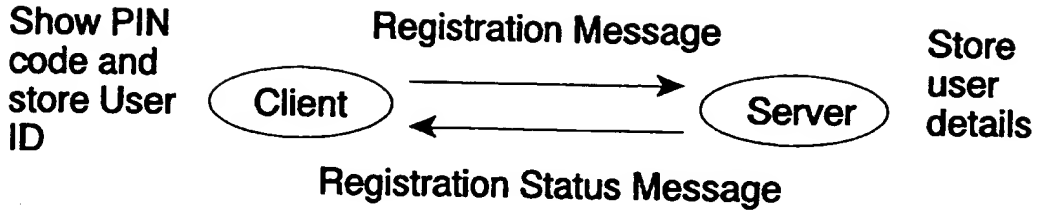

Fig.5

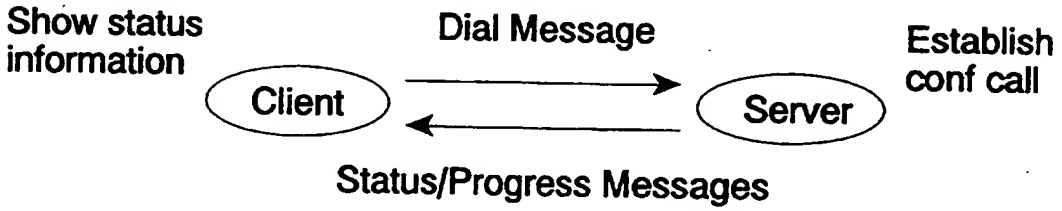

Fig.6

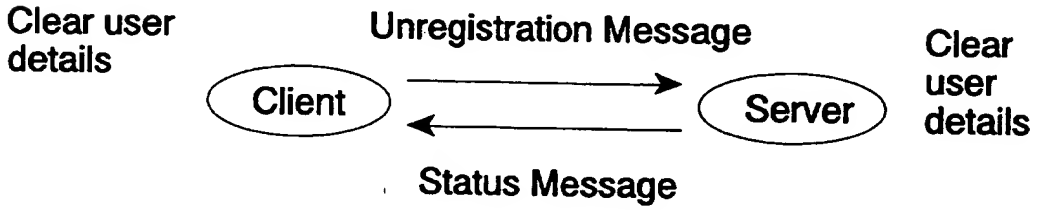

Fig.7

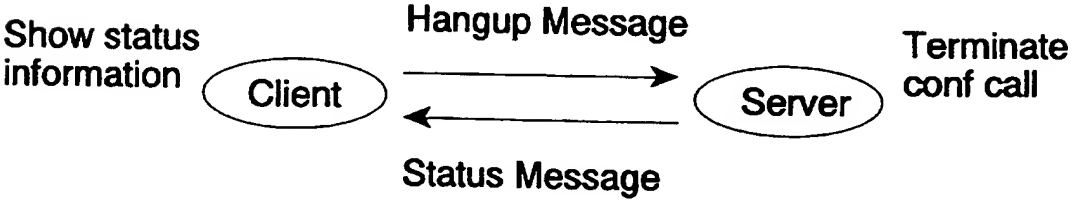

Fig.8